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[10191/857]

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THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of: : Examiner: Ta Hsung Tung
: :
Gerhard SCHNEIDER et al. : :
: :
For: PLANAR SENSOR : :
ELEMENT : :
: :
Filed: October 21, 1998 : :
: : Art Unit 1753
: :
Serial No.: 09/176,124 : :
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Richard N. Mayer

**APPELLANTS' REPLY BRIEF
UNDER 37 C.F.R. § 1.193**

SIR:

Appellants submit the present Reply Brief in
response to the Examiner's Answer mailed January 29, 2003.
Two duplicate copies of this Reply Brief are also being
submitted herewith as a courtesy to the Board.

REMARKS

I. Introduction

Claims 1 and 3 to 5 stand rejected under
35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,505,806
("Yamada '806").

Claims 1 and 3 to 5 stand rejected under
35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,505,807
("Yamada '807").

Claims 1 and 3 to 7 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent No. 5,529,677 ("Schneider") in view of either Yamada '806 or Yamada '807.

For at least the reasons set forth below and in the Appeal Brief mailed on December 9, 2002, the rejections of claims 1 and 3 to 7 should be reversed.

II. Grounds of Rejection of Claims 1 and 3 to 5

The Answer states in error that claims 1 and 3 to 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamada '806 or Yamada '807. See Answer page 3, lines 6 to 7. Claims 1 and 3 to 5 were finally rejected under **35 U.S.C. § 102(b)**, as anticipated by either Yamada '806 or Yamada '807, **not** 35 U.S.C. § 103(a).

III. Regrouping of Claims 6 and 7

Appellants respectfully acknowledges the regrouping of claims 6 and 7 with claim 1 instead of claim 5.

IV. The Rejection of Claims 1 and 3 to 5 under 35 U.S.C. § 102(b)

In support of the rejection of claims 1 and 3 to 5 under 35 U.S.C. § 102(b) as anticipated by Yamada '806 and Yamada '807, it is asserted -- for the first time during the prosecution of this application -- that the Yamada '806 and Yamada '807 heaters "inherently act to distribute heat in the same manner as that of [A]ppellant[s'] heater because the patented devices have the same structure as that recited by [A]ppellant[s'] claims." Answer pages 6 to 7.

Nowhere in Yamada '806 or Yamada '807 is there any indication that the heater elements are centered so as to assure a homogenous distribution of heat across a cross section of the sensor. Nor has any showing been made that Yamada '806 or Yamada '807 sensors have structures which necessarily result in a homogenous distribution of heating

power across their respective cross sections. To the extent that the doctrine of inherency is being relied on, the Examiner must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flows from the teachings of the applied art." See M.P.E.P. § 2112; emphasis in original; and see, Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Inherency may not be established, however, by probabilities and possibilities, and "[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient." Ex Parte Skinner, 2 U.S.P.Q.2d 1788, 1789 (Bd. Pat. App. & Inter. 1986). Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic.

As stated above, no showing has been made that the Yamada '806 or Yamada '807 sensors have structures which necessarily result in a homogenous distribution of heating power across their respective cross sections. Unsupported statements, such as "[t]here is no reason why this layer would prevent the homogenous distribution of heat," do not satisfy this burden. See Answer page 7, lines 7 to 8. Furthermore, the Examiner's assertion that the Yamada '806 or Yamada '807 sensors have the same structure as that recited by Appellants' claims is made without even a basic a comparison of the actual devices. Appellants respectfully submit the Yamada '806 or Yamada '807 sensors have very different structures given that they are double sensors, i.e., they have both an oxygen pump and an oxygen concentration cell sandwiching a heater layer. Accordingly, the anticipation rejection as to the rejected claims must necessarily fail for the foregoing reasons and for the reasons more fully set forth in the Appeal Brief.

V. The Rejection of Claims 1 and 3 to 7 under 35 U.S.C. § 103(a)

The Answer reasserts the reasoning, in light of what is asserted to be considered basic knowledge or common sense, for the 35 U.S.C. § 103(a) rejection of claims 1 and 3 to 7 over the combination of Schneider in view of either Yamada '806 or Yamada '807. See Answer page 10, lines 2 to 12. However, the Office has yet to provide a single shred of evidence, outside of Appellants' own Specification, to support the alleged suggestion to combine Schneider and either Yamada '806 or Yamada '807. The Answer merely states, with any support whatsoever, that it is "common knowledge" that electrolyte measurement is temperature-sensitive and that "fundamental physics" dictates that a significant temperature gradient can cause cracking. See Answer page 9, lines 17 to 24. This reliance on alleged "common knowledge" and "fundamental physics" is directly contrary to Federal Circuit precedent. In the recent cases of In re Zurko, 59 U.S.P.Q.2d 1693 (Fed. Cir. 2001) and In re Lee, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002), the Federal Circuit made clear that unsupported assertions of "basic knowledge" and "common sense" cannot be substituted for the deficiencies of cited references. In this regard, in reversing conclusions of obviousness, the Federal Circuit stated that "the deficiencies of the cited references cannot be remedied by . . . general conclusions about what is 'basic knowledge' or 'common sense' to one of ordinary skill in the art." In re Zurko, 59 U.S.P.Q.2d at 1697. Moreover, the Federal Circuit in In re Lee stated:

The determination of patentability on the grounds of unobviousness is ultimately one of judgment. In furtherance of the judgmental process, the patent examination procedure serves both to find, and to place on the official record, that which has been considered with respect to patentability. The patent examiner and the Board are deemed to have experience in the field of the invention; however, this experience, insofar as applied to the determination of patentability, must be applied from the viewpoint of "the person having ordinary skill in the art to which said

subject matter pertains," the words of section 103. In finding the relevant facts, in assessing the significance of the prior art, and in making the ultimate determination of the issue of obviousness, the examiner and the Board are presumed to act from this viewpoint. Thus when they rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record. The failure to do so is not consistent with either effective administrative procedure or effective judicial review. The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.

In re Lee, 61 U.S.P.Q.2d at 1435 (emphasis added).

Appellants respectfully submit that whether it is common knowledge that electrolyte measurement is temperature-sensitive and whether fundamental physics dictates that a significant temperature gradient can cause cracking does not, in and of itself, provide the motivation required to combine Schneider with either Yamada '806 or Yamada '807. The foregoing assertions establish only that the cause of a possible problem with electrolytic temperature measurement devices may be known. However, just because a possible problem and its cause may be well known does not necessarily mean that a proposed solution, no matter how technologically simple it may appear, is also well known. In other words, the inquiry is not whether the cause of a problem maybe obvious, but rather whether the proposed solution, taken as a whole within the context of the claims under examination, would have been obvious to the ordinary artisan. None of the references cited in any of the Office Actions to date discloses, teaches, or suggests centering a heating conductor in a sensor having a single or double measuring cell layers and, as such, none of these references discloses, teaches, or suggests that centering the heating conductor produces any advantages whatsoever. The only arguments asserted regarding the proposed solution of the present invention is that it

allegedly would have been obvious to arrange a heater in a plane half way up a sensor because (i) such a location purportedly permits distribution of heat to all portions of the sensor element equally and (ii) Yamada '806 or Yamada '807 purportedly disclose a sensor having a heater layer somewhere close to the middle of the sensor. See Answer page 4, line 18 to page 5, line 7. Appellants address each of these arguments separately below:

**A. Argument Relating to Alleged
Obviousness of a Center Heater Location
Resulting in an Equal Distribution of Heat**

It is not understood why it is asserted that it would have been obvious to a skilled artisan at the time the application was filed to want to heat all the portions of the sensor element equally. The design of a sensor, like other complex devices, involves many different design variables, including, but not limited to, efficiency, manufacturing cost, reliability and accuracy. The Answer alleges that it is fundamental physics that a significant temperature gradient at different portions can cause thermal stress. See Answer page 10, line 21 to page 11, line 3. Appellants respectfully submit that even if this is the case it does not mean that it would have been obvious to a person of ordinary skill in the art at the time the invention claimed was made to add a covering layer to a sensor having a single measuring cell layer to assure a homogenous distribution of the heating power over a cross section of the sensor. Adding a covering layer clearly affects the manufacturing cost design variable and may have an effect on other design variables. If one goal of the heating element is to heat the measuring cell layer, there is no reason to place a covering layer (shown in Figure 1 to be a solid foil) on the measuring cell layer so as to spread heat over a larger cross sectional area and, thus, shift heat away from the measuring cell layer the heater was originally inserted to heat. If one was required to add a covering layer for protective or insulative purposes, it would have been a

first instinct to minimize the thickness of this layer so as to minimize waste and heater energy expenditure of the heater. Note that layer 29 in Schneider is referred to as "insulation." See, for example, col. 2, line 56. The foregoing emphasizes the fact that statement, that it would have been obvious for Schneider to arrange its heater in a plane half way up the sensor as purportedly shown by either Yamada '806 or Yamada '807., because such a location purportedly permits distribution of heat to all portions of the sensor element equally, is an oversimplification of the matter.

Moreover, the allegation that "[i]t would have been obvious for Schneider to arrange its heater in a plane half way up the sensor as shown by either Yamada" because of purported concerns relating to "thermal shock" is plainly based on the Specification of the present application. In this regard, Schneider, Yamada '806 and Yamada '807 fail to make any mention of "thermal shock." However, the Specification of the present application states at page 2, lines 1 to 2 that "a resistance of the sensor element to temperature variations and thermal shock is improved" (emphasis added). Thus, the present rejection is plainly and improperly based on hindsight reconstruction. It is, of course, "improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to '[use] that which the inventor taught against its teacher.'" In re Lee, 61 U.S.P.Q.2d at 1434 (quoting W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 312-313 (Fed. Cir. 1983)). Indeed, it is not even alleged in the Final Office Action, the Advisory Action or the Answer that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the combinations proposed. In this regard, the Answer states at page 4 that "[i]t would have been obvious for Schneider to arrange its heater in a plane half way up the sensor as shown by either Yamada, because such a location would permit distribution of heat to all portions of the sensor element

equally," which makes no reference to that which would have been obvious to one of ordinary skill in the art at the time the invention was made. Furthermore, the Answer alleges at page 5 that "[t]he combination of the references is believed to be especially obvious in view of the statement at col. 9, lines 25-29 of Yamada '807 that his heater acts to efficiently heat the entire oxygen sensor," not only fails to make reference to that which would have been obvious to one of ordinary skill in the art at the time the invention was made, but is expressed with reference to the present. Such allegations cannot support an obviousness rejection under 35 U.S.C. § 103(a), which requires that obviousness be determined based on whether "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

The allegations contained in the Answer plainly and improperly rely on conclusory hindsight, reconstruction and speculation. See In re Dembiczak, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999) and In re Jones, 21 U.S.P.Q.2d at 1943, 1944. Accordingly, the failure to provide proper evidence of a motivation for modifying or combining the references to provide the claimed subject matter constitutes a failure to properly establish obviousness of the present claims.

B. Argument Relating to Purported Disclosure by Yamada '806 or Yamada '807 of a Sensor Having a Heater Close to the Middle

Claims 1 and 3 to 7 were rejected under 35 U.S.C. 103(a) based on Schneider in view of Yamada '806 or Yamada '807. The reliance on a patent that purportedly discloses a sensor having two measuring cell layers, i.e., Yamada '806 or Yamada '807, to provide the motivation regarding placement of a heater in a sensor having a single measuring cell layer, i.e., Schneider, is fundamentally flawed. Yamada '806 and Yamada '807 purportedly relate to a heated double sensor,

i.e., a sensor having two measuring cell layers (one oxygen pump layer and one oxygen concentration layer) and Schneider purportedly relates to a heated single sensor, i.e., a sensor having a single measuring cell layer. Appellants respectfully submit that placement of a heater in a double sensor, such as the Yamada '806 or Yamada '807 double sensor, does not render obvious placement a heater in a single sensor, such as the one in Schneider. Much less does it render obvious the increase of the thickness of a covering layer on a single sensor so as to center the heater and assure homogeneity of heating power across a cross section of the sensor. Yamada '806 and Yamada '807 do not discuss, or even suggest, optimal placement of a heater in a single sensor. The structure of a single sensor and a double sensor is different. If Yamada '806 and Yamada '807 can be stated to describe anything about a single sensor, other than basic sensor design common to both sensors, it is to maintain the standard structure of a single sensor and add an additional measuring cell layer to build a double sensor, i.e., sandwich a heater between two measuring cell layers to create a heated double sensor. The statement in Yamada '807 (col. 9, lines 25 to 29), quoted in the Answer at page 7, lines 3 to 5 therefor, about the heater acting efficiently to heat the entire double sensor cannot be understood as providing a motivation to center the heater in a single sensor device so as to assure homogeneity of the heat power across a cross section of the sensor. This is because, firstly, the Yamada '806 and Yamada '807 sensors are double sensors not single sensors, as in Schneider, and thus, by their very nature, must have different configurations. Second, because efficiency and homogeneity mean very different things. Yamada '807 may very well have been referring to the quality of the heater itself as opposed to its positioning. A poor quality heater would not efficiently heat the entire sensor. Accordingly, the rejection of the claims based on Schneider in view of either Yamada '806 or Yamada '807 is flawed and should fail for the foregoing reasons. Similarly, for the foregoing reasons it would not have been obvious to

modify the Yamada '806 or Yamada '807 double sensor, to create a single sensor having a centered heater, in view of the Schneider single sensor.

VI. CONCLUSION

For the foregoing reasons and for the reasons more fully set forth in the Appeal Brief, it is respectfully submitted that the final rejections of claims 1 and 3 to 7 should be reversed.

Respectfully submitted,

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Dated: March 27, 2003

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